



## MATH 140: WEEK-IN-REVIEW 7 (REVIEW OF ALGEBRA &amp; CHAPTER 5.1)

1. Evaluate each of the following and simplify completely.

(a)  $\frac{3}{4} \cdot 16$

(b)  $\left(-\frac{4}{15}\right) \div \frac{2}{5}$

(c)  $-\frac{13}{10} + \frac{7}{15}$

(d)  $\frac{3}{5} - \left(\frac{6}{7}\right)$

(e)  $\frac{8}{13} \cdot \frac{26}{15} \cdot \frac{45}{16}$

(f)  $\frac{5}{7} + \frac{8}{13} + \left(-\frac{5}{7}\right)$



2. Evaluate each of the following and simplify completely.

(a)  $\frac{1}{2^{-3}}$

(b)  $\left(\frac{3}{7}\right)^{-2}$

(c)  $2^3 \cdot 2^2$

(d)  $\frac{3^2}{3^4}$

(e)  $\sqrt{\frac{9}{4}}$

(f)  $-\sqrt{64}$

(g)  $\sqrt{-81}$

(h)  $\sqrt[3]{-8}$



3. Simplify the following using the order of operations

(a)  $2(3 + 5 \cdot 4) - 6^2$

(b)  $4^2 - 15 \div (8 - 3)$

(c)  $(x - y)^2$  when  $x = 5$  and  $y = 7$

4. Simplify each of the following expressions

(a)  $2a^2 + 4a + 8 + 6a^2 + 5a - 4$

(b)  $(2x)^2(4x)$

(c)  $\left(\frac{1}{5}b^6\right)(15b^3)$



Expand and simplify each of the following expressions

(d)  $4s^3(s^2 - 2s + 3)$

(e)  $(2y + 3)(y + 5)$

(f)  $(2x + 4)(x^2 + x - 1)$

(g)  $(4 + 2x)(4 - 3x)$

(h)  $\frac{2x - 3}{x - 2} \cdot \frac{2 - x}{x + 1}$



5. Factor each of the following expressions

(a)  $5x^3 - 10x^2 + 15x$

(b)  $w^2 - 8w + 15$

(c)  $r^2 - 4r - 12$

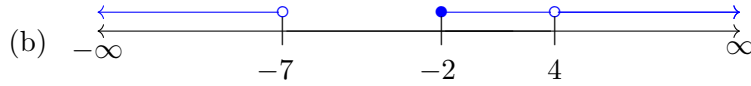
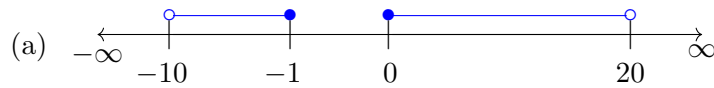
(d)  $6y^2 - y - 15$

(e)  $96p^2 - 76p$

(f)  $6q^2 + 3$



6. Express each of the following using interval notation



7. For each of the following, draw a number line representing the given information, and then write the equivalent statement using interval notation.

(a)  $\left\{x \mid x < -\frac{2}{5}\right\}$

(b)  $\{x \mid x \leq -3 \text{ and } x > 15\}$

(c)  $\{x \mid x > -75 \text{ and } x \leq 10 \text{ and } x \neq 4\}$

(d)  $\{x \mid x \leq -1 \text{ or } x > 3\}$



8. State the inputs and outputs of the given relations.

(a)  $R_1 = \{(5, -12), (-4, 3), (-10, 3), (12, 12)\}$

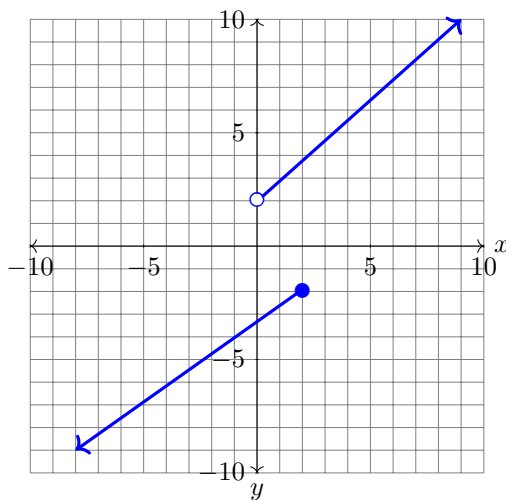
(b)  $R_2 = \{(-20, 45), (45, -20), (15, -15), (45, 17)\}$

9. Determine if the given relation is a function. If it is a function, state the domain and range of the function.

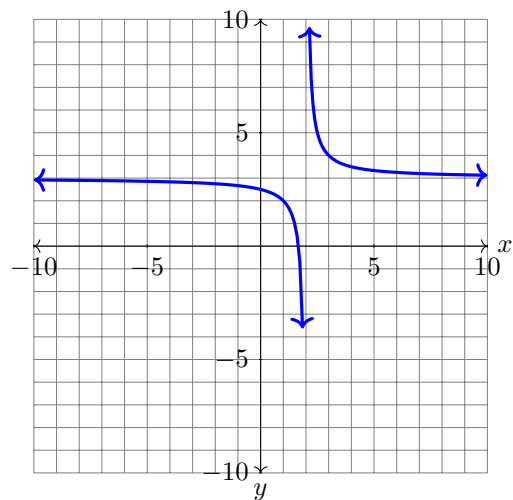
(a)  $R_3 = \{(5, -12), (-4, 3), (-10, 3), (12, 12)\}$

(b)  $6x + 7y = 42$

(c)

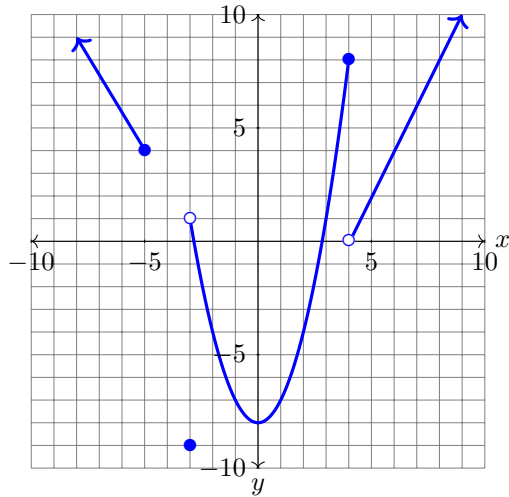


(d)





10. Use the graph of  $f(x)$  below to answer each of the following.



- (a)  $f(-4)$
- (b)  $f(2)$
- (c)  $f(4)$
- (d)  $f(-5)$
- (e) Determine all values of  $x$  such that  $f(x) = 4$
- (f) Determine all values of  $x$  such that  $f(x) = -8$
- (g) Determine all values of  $x$  such that  $f(x) = -9$
- (h) State the domain of  $f(x)$ .
- (i) State the range of  $f(x)$ .





11. Given the function  $g(x) = 4 - 3x$ , determine each of the following. Simplify your solutions as much as possible.

(a)  $g(6)$

(b)  $g(2s)$

(c)  $g(x - 5)$

(d)  $g(x) - g(4)$



12. Given the function  $f(x) = 3x^2 - 2x$ , determine each of the following. Simplify your solutions as much as possible.

(a)  $f(-2)$

(b)  $f(x + h)$

(c)  $f(x + h) - f(x)$